VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Please replace the paragraph beginning on page 3, line 13 with the following paragraph.

To induce the correct motion out of the player, in addition to simply showing the animated dancing (or any other motion) character, a display method called the "sliding ghost" metaphor is introduced. Sliding ghosts refer to consecutive freeze frames of the motion data. The main animated dancing character is located in the middle of a display (by default facing toward the player looking into the screen), and at any given time instance (say at $t = t1$), a few frozen motion frames (drawn as a transparent ghostly figure) of $t1 + k1*\Delta t$, $t1 + k2*\Delta t$, $t1 + k3*\Delta t$, $t1 + k4*\Delta t$, ... $t1 + kn*\Delta t$ are shown beside the main character in the middle. **Here, each kn a numerical factor such that kn*Δt represents a time in the future. Each ghost represents a result of a body movement (or position) at some point in the future of the main animated character.** The ghosts are drawn at a fixed distance from the main character proportional to how advanced in time of frame they represent. **In other words, the physical distance of each ghost from the main animated character is substantially in proportion to the temporal distance of each ghost's future time frame from the current time frame.** Therefore, as time progresses, each frozen ghostly frame is seen approaching toward, and finally merging into, the main frame.

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Please replace the paragraph beginning on page 7, line 32 with the following paragraph.

The original motion data is captured from a performer with a nominal body size and its data can not directly be compared to a player whose body size may be different. The player is instructed to supply one's height, so that the original motion data can be scaled and be "retargeted" for the current player. That is to say, the retargeting is a process to normalize the body size difference of the current player and the person who performed for the original motion capture. An example of the motion retargeting process **500** is shown in FIG. 5. Once the height, or other relevant body factors, of the game player is received by input from a user (alternatively, image processing techniques can be used to automatically approximate the height of the player), the approximate body ratio between the original motion capturer and the player is computed and the motion data is scaled uniformly about the center of the body according to the ratio. A translation of the whole body data may be needed to satisfy the constraint that the character's feet should be attached to the ground. For instance, after a scale down operation, the transformed character may appear floating in the air, thus there would be a need to translate its center downward until its feet touches the ground.

Please replace the paragraph beginning on page 8, line 11 with the following paragraph.

FIG. 3 shows **[the]** **an example** general frame structure **300** of the motion data and the concept of the ghost metaphors according to an aspect of the present invention. A motion data, in fact, is a sequence of stances sampled at about 20-30 times per second. Each "frame" in the sequence holds data for a three-dimensional position and their orientation for a number of body parts (usually at the articulation points of the body). By associating these data to an

appropriately sized skeleton, animation can be reconstructed by drawing the skeleton at the rate equal to the original sampling rate. For animation purposes, motion frames are generally stored in a special format, for instance, called BVH.

Please replace the paragraph beginning on page 9, line 8 with the following paragraph.

Also, for enhanced viewing of the motion data, the player can set the view point from the front (and follow the motion as if viewing a mirror), from the back, from the sides (left or right), and so on. Key postures may be augmented with short texts/audio display (located in the lower part of the screen underneath the main character) to further inform the player of the next/current dance (motion) segment to perform (e.g. "hands up!", "disco time", etc.). The key postures and annotated texts/sounds are designated using a separate management tool preferably by the motion expert (e.g. dancer) and saved in a separate file. The motion of the player is captured by tracking specific articulation positions on the player's body (its mechanism to be explained later). These may include the two wrists, two ankles, and the belly. To give feedback and inform the player of how well one is following the motion on the screen, whenever the player's tracked positions fall within a threshold value of where it should be, the corresponding positions on the animated figure may be highlighted with special effects (e.g. exploding lights) and is given commendation (e.g. "perfect", "excellent", "good", etc.). FIG. 4 is [a description drawing] **<u>an exemplary display 400</u>** for describing a method of displaying the dance (or motion) according to an aspect of the present invention.

Please replace the paragraph beginning on page 9, line 23 with the following paragraph.

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FIG. 6 is a detailed block diagram **600** of the motion capture module according to an aspect of the present invention. The body positions are tracked by having the player wear reflective markers on the respective positions, and by using cameras with infrared light diodes/filter, a digital signal processing (DSP) board and a computer.

Please replace the numbered items beginning on page 12, line 14 with the following numbered items.

1. Either from the original motion data, or from the previous marker information (velocity/acceleration/direction), compute the next predicted marker location **(step 710)**.

2. Project the predicted marker position into 2D camera space. Send these data to the DSP board **(step 720)**.

3. DSP board opens a prediction search window and the prescribed location with a preset window size (determined by trial and error). Compute the 2D location of the markers and send these data back to the computer **(step 720)**.

4. Computer selects two appropriate data set and triangulates them to obtain 3D positions of the markers of the player **(step 730)**.

5. If the player's markers are within a certain distance range, assign a score (e.g. within 5 units, score 5, within 4 units, score 4, and so on) **(step 740)**. Perfectly followed motion will produce a score of 25. Multiply the score by a relative weight (e.g. if this is a key posture it may be weighted more than a non key posture frame). At each instant, if the score is above certain range, assign

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commendation (e.g. > 24, – perfect, > 19 excellent, > 14 good, etc.). Score / frame = relative weight * sum (miniscore for each marker).